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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/693,958 | 10/28/2003 | Hayato Nakanishi | 117528 | 4567 |

25944 7590 04/03/2007
OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

BODDIE, WILLIAM

ART UNIT PAPER NUMBER

2629

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 04/03/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/693,958 | Applicant(s) NAKANISHI, HAYATO | |
| | Examiner William L. Boddie | Art Unit 2629 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

1. In an amendment dated, January 12th, 2007, the Applicant amended claims 1-3, 5-6 and added new claims 8-17. Currently claims 1-17 are pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 12th, 2007 has been entered.

Response to Arguments

3. Applicant's arguments with respect to claims 1 and 3-7 have been considered but are moot in view of the new ground(s) of rejection.
4. Applicant's arguments filed January 12th, 2007 with regards to claim 2 have been fully considered but they are not persuasive.
5. In response to applicant's argument, on the bottom of page 8 of the Remarks, that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the

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applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

6. In response to applicant's argument, on page 8 of the Remarks, that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Applicant argues that the motivation to combine would not benefit Enami.

The Examiner respectfully disagrees. The Applicant is pointed again to column 1, line 37 through 46 of Plus. In this disclosure, Plus states that "three types of failures which frequently occur during the fabrication of **LCD displays** are failed data line scanner stages, open data lines and shorts between select lines and data lines" (emphasis added). It is clear from this statement that failures frequently occur in LCD displays. Plus' invention is reliable, fast and inexpensive circuitry to detect these failures. Enami is quite clearly a liquid crystal display, see the title, and as such would benefit from such circuitry. This overlap is seen as more than sufficient to motivate one of ordinary skill in the art to include the detection circuitry of Plus in the display of Enami.

Claim Rejections - 35 USC § 103

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enami et al. (US 5,892,493) in view of LeChevalier (US 6,594,606).

With respect to claim 1, Enami discloses, an electro-optical device (fig. 1), comprising:

a plurality of scanning lines (G1-Gn in fig. 1);

a plurality of data lines (d1A-dnD in fig. 1);

a plurality of pixel circuits (24, 18 in fig. 1) including a plurality of electro-optical elements (18 in fig. 1) provided to correspond to intersections of the plurality of scanning lines and the plurality of data lines;

a data line driving circuit (40 in fig. 1) to supply a data voltage through the data line to each of the pixel circuits (col. 8, lines 48-60);

first switches (42 in fig. 1) that are part of a precharge circuit (42-46 in fig. 1) to control the supply of a precharge signal ($\pm V_1$ in fig. 1) from a precharge signal supply line (output line from switch 46 in fig. 1) connected to at least one data line of the plurality of data lines (clear from fig. 1), the precharge signal being less than a data voltage (col. 8, lines 24-33).

Enami does not expressly disclose a second set of switches for output of a detection signal to test lines, or a data line selection circuit that sets the state of the switches.

LeChevalier discloses, a pre-charging display device (fig. 3) comprising: second switches (412, 420, 414 in fig. 4) connected to at least one data line (358 in fig. 1) of a plurality of data lines (358, 368 etc. in fig. 3) to control the output of a detection signal (col. 9, lines 49-58; col. 8, lines 4-9) from the at least one data line to test lines (410, for example in fig. 4; each line connected to each column's switch); and

a data line selection circuit (428, 432 in fig. 4) to set the on or off state of switches that control the output of the detection signal (col. 9, lines 38-49);

the detection signal being used for testing whether a sufficient data voltage has been written in the pixel circuits (col. 14, line 55 – col. 15, line 11).

LeChevalier and Enami are analogous art because they are both from the same field of endeavor namely precharging control circuitry for flat panel displays.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the detection circuitry of LeChevalier in the display device of Enami.

The motivation for doing so would have been for power conservation and appropriate precharge voltage application (LeChevalier; col. 4, lines 9-18).

With respect to claim 3, Enami discloses, an electro-optical device (fig. 1), comprising:

a plurality of scanning lines (G1-Gn in fig. 1);

a plurality of data lines (d1A-dnD in fig. 1);

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a plurality of pixel circuits (24, 18 in fig. 1) including a plurality of electro-optical elements (18 in fig. 1) provided to correspond to intersections of the plurality of scanning lines and the plurality of data lines;

at least two precharge lines (lines output from switch 46 in fig. 1; there is clearly one for each data line) to supply precharge signals ($\pm V_1$ in fig. 3) to at least two data lines of the plurality of data lines;

a data line driving circuit (40 in fig. 1) to supply a data voltage through the data line to each of the pixel circuits (col. 8, lines 48-60);

first switches (42 in fig. 1) that are part of a precharge circuit (42-46 in fig. 1) to control the output of the precharge signal ($\pm V_1$ in fig. 1) from the at least two precharge lines to the at least two data lines (clear from fig. 1), each precharge signal being less than a data voltage (col. 8, lines 24-33).

Enami does not expressly disclose a second set of switches for output of a detection signal.

LeChevalier discloses, a pre-charging display device (fig. 3) comprising: second switches (412, 420, 414 in fig. 4) connected to at least one data line (358 in fig. 1) of a plurality of data lines (358, 368 etc. in fig. 3) to control the output of a detection signal (col. 9, lines 49-58; col. 8, lines 4-9) from the at least one data line to test lines (410, for example in fig. 4); and

a data line selection circuit (428, 432 in fig. 4) to set the on or off state of switches that control the output of the detection signal (col. 9, lines 38-49);

the detection signal being used for testing whether a sufficient data voltage has been written in the pixel circuits (col. 14, line 55 – col. 15, line 11).

LeChevalier and Enami are analogous art because they are both from the same field of endeavor namely precharging control circuitry for flat panel displays.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the detection circuitry of LeChevalier in the display device of Enami.

The motivation for doing so would have been for power conservation and appropriate precharge voltage application (LeChevalier; col. 4, lines 9-18).

With respect to claim 4, Enami and LeChevalier disclose, an electro-optical device according to claim 3 (see above).

LeChevalier further discloses, a data line selection circuit (428, 432 in fig. 4) to control the on or off state of switches sequentially (col. 3, lines 48-51).

With respect to claim 5, Enami discloses, a method of driving an electro-optical device (col. 1, lines 7-9), including:

- a plurality of scanning lines (G1-Gn in fig. 1);
- a plurality of data lines wired to intersect the scanning lines (d1A-dnD in fig. 1);
- a plurality of pixel circuits (24, 18 in fig. 1) including electronic circuits provided to correspond to intersections of the scanning lines and the data lines (18, 24 in fig. 1);
- a data line driving circuit (40 in fig. 1) to supply a data voltage through the data line to each of the pixel circuits (col. 8, lines 48-60);
- first switches (42 in fig. 1)) that are part of a precharge circuit (42-46 in fig. 1) to control the supply of a precharge signal ($\pm V_1$ in fig. 1) from a precharge signal supply

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line (output line from switch 46 in fig. 1) connected to at least one data line of the plurality of data lines (clear from fig. 1), the precharge signal being less than a data voltage (col. 8, lines 24-33),

supplying a precharge signal from a precharge signal supply line to the data lines through the first switches when one of the plurality of scanning lines is selected (col. 9, lines 43-52); and

supplying data signals to electronic circuits connected to the selected scanning line through the data lines (col. 8, lines 48-60).

Enami does not expressly disclose a second set of switches for output of a detection signal, or outputting data signals supplied to the data lines as detection signals to test lines.

LeChevalier discloses, a pre-charging display device (fig. 3) comprising: second switches (412, 420, 414 in fig. 4) connected to at least one data line (358 in fig. 1) of a plurality of data lines (358, 368 etc. in fig. 3) to control the output of a detection signal (col. 9, lines 49-58; col. 8, lines 4-9) from the at least one data line to test lines (410, for example in fig. 4); and

a data line selection circuit (428, 432 in fig. 4) to set the on or off state of switches that control the output of the detection signal (col. 9, lines 38-49);

the detection signal being used for testing whether a sufficient data voltage has been written in the pixel circuits (col. 14, line 55 – col. 15, line 11);

outputting data signals supplied to the data lines as detection signals to test lines through the second switches (col. 7, lines 58-67); and

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using the detection signal for testing whether a sufficient data voltage has been written in the pixel circuit (col. 14, line 55 – col. 15, line 11).

LeChevalier and Enami are analogous art because they are both from the same field of endeavor namely precharging control circuitry for flat panel displays.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the detection circuitry of LeChevalier in the display device of Enami.

The motivation for doing so would have been for power conservation and appropriate precharge voltage application (LeChevalier; col. 4, lines 9-18).

With respect to claim 6, Enami discloses, a method of driving an electro-optical device (col. 1, lines 7-9), including:

- a plurality of scanning lines (G1-Gn in fig. 1);

- a plurality of data lines wired to intersect the scanning lines (d1A-dnD in fig. 1);

- a plurality of pixel circuits (24, 18 in fig. 1) including electronic circuits provided to correspond to intersections of the scanning lines and the data lines (18, 24 in fig. 1);

- at least two precharge lines (lines output from switch 46 in fig. 1; there is clearly one for each data line) to supply precharge signals ($\pm V_1$ in fig. 1) to at least two data lines of the plurality of data lines;

- a data line driving circuit (40 in fig. 1) to supply a data voltage through the data line to each of the pixel circuits (col. 8, lines 48-60);

- first switches (42 in fig. 1)) that are part of a precharge circuit (42-46 in fig. 1) to control the supply of a precharge signal ($\pm V_1$ in fig. 1) from a precharge signal supply line (output line from switch 46 in fig. 1) connected to at least one data line of the

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plurality of data lines (clear from fig. 1), the precharge signal being less than a data voltage (col. 8, lines 24-33),

supplying a precharge signal from a precharge signal supply line to the data lines through the first switches when one of the plurality of scanning lines is selected (col. 9, lines 43-52); and

supplying data signals to electronic circuits connected to the selected scanning line through the data lines (col. 8, lines 48-60).

Enami does not expressly disclose a second set of switches for output of a detection signal, or outputting data signals supplied to the data lines as detection signals to test lines.

LeChevalier discloses, a pre-charging display device (fig. 3) comprising: second switches (412, 420, 414 in fig. 4) connected to at least one data line (358 in fig. 1) of a plurality of data lines (358, 368 etc. in fig. 3) to control the output of a detection signal (col. 9, lines 49-58; col. 8, lines 4-9) from the at least one data line to test lines (410, for example in fig. 4); and

a data line selection circuit (428, 432 in fig. 4) to set the on or off state of switches that control the output of the detection signal (col. 9, lines 38-49);

the detection signal being used for testing whether a sufficient data voltage has been written in the pixel circuits (col. 14, line 55 – col. 15, line 11);

outputting data signals supplied to the data lines as detection signals to test lines through the second switches (col. 7, lines 58-67); and

using the detection signal for testing whether a sufficient data voltage has been written in the pixel circuit (col. 14, line 55 – col. 15, line 11).

LeChevalier and Enami are analogous art because they are both from the same field of endeavor namely precharging control circuitry for flat panel displays.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the detection circuitry of LeChevalier in the display device of Enami.

The motivation for doing so would have been for power conservation and appropriate precharge voltage application (LeChevalier; col. 4, lines 9-18).

With respect to claim 7, Enami and LeChevalier disclose the electro-optical device according to claim 1 (see above).

Enami further discloses, an electronic apparatus (col. 1, lines 7-21).

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enami et al. (US 5,892,493) in view of Plus et al. (US 5,113,134).

With respect to claim 2, Enami discloses, an electro-optical device (fig. 1), comprising:

a plurality of scanning lines (G1-Gn in fig. 1);

a plurality of data lines (d1A-dnD in fig. 1);

a plurality of pixel circuits (24, 18 in fig. 1) including a plurality of electro-optical elements (18 in fig. 1) provided to correspond to intersections of the plurality of scanning lines and the plurality of data lines;

a data line driving circuit (40 in fig. 1) to supply a data voltage through the data line to each of the pixel circuits (col. 8, lines 48-60);

first switches (42 in fig. 1) to control the supply of precharge signals ($\pm V_1$ in fig. 1) from input signal lines (output line from switch 46 in fig. 1) connected to at least one data line of the plurality of data lines to the at least one data line, the precharge signal being less than a data voltage (col. 8, lines 24-33); and

a data line selection circuit to set the on or off state of the first switches (44 in fig. 1).

Enami does not expressly disclose, a set of switches for controlling the output of a test signal, or a data line selection circuit that sets the state of the switches.

Plus discloses, a set of switches (17) connected to at least one data line (12) of a plurality of data lines to control the output of a detection signal (col. 3, lines 12-33) from the at least one data line to test lines (18-x); and

a data line selection circuit (19) to set the on or off state of switches (17) that control the output of the detection signal (col. 3, lines 5-11; also note the orientation of the monitoring circuitry, opposite the data line scanner. This orientation is identical to the precharge circuitry of Enami).

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the detection circuitry of Plus in the precharge circuitry of Enami.

Furthermore the placement of the circuitry in each piece of art would suggest to meld the two pieces of circuitry, detection and precharge, into a single piece of circuitry.

The motivation for doing so would have been a reliable, fast and inexpensive circuit to test for circuit flaws (Plus; col. 1, lines 37-46).

10. Claims 8, 12, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enami et al. (US 5,892,493) in view of LeChevalier (US 6,594,606) and further in view of LeChevalier (US 7,050,024).

With respect to claims 8, 12, 14 and 16, Enami and LeChevalier-606 disclose, the electro-optical device of claims 1, 3, 5 and 6 (see above).

Neither LeChevalier-606 nor Enami expressly disclose, wherein the test lines are shared with a precharge signal supply line.

LeChevalier-024 discloses, wherein test lines (right side of 274 in fig. 8; input of 822) are shared with a precharge signal supply line (left side of 274; output of 812 in fig. 8).

LeChevalier-024, LeChevalier-606 and Enami are analogous art because they are both from the same field of endeavor namely precharging control circuitry for flat panel displays.

At the time of the invention it would have been obvious to one of ordinary skill in the art to wire the circuitry of LeChevalier-606 and Enami as taught by LeChevalier-024.

The motivation for doing so would have been to reduce the amount of wiring thereby lessening manufacturing costs as well as simplifying circuitry.

11. Claims 8, 12, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enami et al. (US 5,892,493) in view of LeChevalier (US 6,594,606) and further in view of Rutherford (US 6,861,810).

With respect to claims 9, 13, 15 and 17, Enami and LeChevalier disclose, the electro-optical device of claims 1, 3, 5 and 6 (see above).

Neither Enami nor LeChevalier expressly disclose, supplying at least three precharge signals, one each selected for red, green, and blue pixel circuits.

Rutherford discloses, supplying at least three precharge signals, one each selected for red, green, and blue pixel circuits (col. 6, lines 7-27).

Rutherford, LeChevalier and Enami are analogous art because they are both from the same field of endeavor namely precharging control circuitry for flat panel displays.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the at least three precharging signals of Rutherford in the display device of Enami and LeChevalier.

The motivation for doing so would have been to ensure pixel white balance, thereby ensuring good display quality (Rutherford; col. 6, lines 7-27).

12. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enami et al. (US 5,892,493) in view of Plus et al. (US 5,113,134) and further in view of LeChevalier (US 7,050,024).

With respect to claim 10, Enami and Plus disclose, the electro-optical device of claim 2 (see above).

Neither Plus nor Enami expressly disclose, wherein the test lines are shared with a precharge signal supply line.

LeChevalier-024 discloses, wherein test lines (right side of 274 in fig. 8; input of 822) are shared with a precharge signal supply line (left side of 274; output of 812 in fig. 8).

LeChevalier-024, Plus and Enami are analogous art because they are both from the same field of endeavor namely precharging control circuitry for flat panel displays.

At the time of the invention it would have been obvious to one of ordinary skill in the art to wire the circuitry of Plus and Enami as taught by LeChevalier-024.

The motivation for doing so would have been to reduce the amount of wiring thereby lessening manufacturing costs as well as simplifying circuitry.

13. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enami et al. (US 5,892,493) in view of Plus et al. (US 5,113,134) and further in view of LeChevalier (US 7,050,024).

With respect to claim 11, Enami and Plus disclose, the electro-optical device of claim 2 (see above).

Neither Enami nor Plus expressly disclose, supplying at least three precharge signals, one each selected for red, green, and blue pixel circuits.

Rutherford discloses, supplying at least three precharge signals, one each selected for red, green, and blue pixel circuits (col. 6, lines 7-27).

Rutherford, Plus and Enami are analogous art because they are both from the same field of endeavor namely precharging control circuitry for flat panel displays.

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At the time of the invention it would have been obvious to one of ordinary skill in the art to include the at least three precharging signals of Rutherford in the display device of Enami and Plus.

The motivation for doing so would have been to ensure pixel white balance, thereby ensuring good display quality (Rutherford; col. 6, lines 7-27).

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Will L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wlb
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AMR A. AWAD
SUPERVISORY PATENT EXAMINER

